DOE/ID-11425
Revision 0

Field Sampling Plan for Operable Unit 10-08 TRA-74 Post-Excavation Soil Confirmation

August 2010

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Project No. 23368

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Prepared for the
U.S. Department of Energy
DOE Idaho Operations Office

ABSTRACT

This Field Sampling Plan, along with the *Quality Assurance Project Plan for Waste Area Groups 1,2,3,4,5,6, 7, 10, and Removal Actions*, constitutes the field sampling plan for soils at the Advanced Test Reactor Complex, Site TRA-74.

Sampling is pursuant to requirements delineated in the *Operable Unit 10-08 Record of Decision for Site-Wide Groundwater, Miscellaneous Sites, and Future Site*. Remedial action at TRA-74 is necessary to reduce potential threats to human health and the environment. Removal and disposal is the remedy selected by the Agencies for TRA-74. Confirmation sampling will be used to confirm that cleanup levels are met after a liner covering and the contaminated soil have been removed.

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ACRONYMS

CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
COC	chain of custody
DQO	data quality objective
EPA	U.S. Environmental Protection Agency
FSP	field sampling plan
ICP	Idaho Cleanup Project
INL	Idaho National Laboratory
OU	operable unit
QA	quality assurance
QC	quality control
QAPjP	Quality Assurance Project Plan
SAM	Sample and Analysis Management
SOW	statement of work
UCL	upper confidence limit
WGS	Waste Generator Services

Field Sampling Plan for Operable Unit 10-08 TRA-74 Post-Excavation Soil Confirmation

1. INTRODUCTION

This Field Sampling Plan (FSP) was prepared for the Idaho Cleanup Project (ICP) Environmental Restoration CERCLA Remediation Project at the Idaho National Laboratory (INL) Site. Activities described in this FSP support soil confirmation sampling at the Advanced Test Reactor Complex, Site TRA-74.

Site TRA-74 consists of contaminated soil under the overhead water tank. The soil was contaminated in 1984 when the tank was sandblasted before repainting, and paint chips containing lead and arsenic fell to the ground. The contaminated soil, expected to have surface contamination, was covered with a temporary synthetic liner along with soil and gravel to stabilize the area and prevent contaminant migration. As discussed in the *Operable Unit 10-08 Record of Decision for Site-Wide Groundwater, Miscellaneous Sites, and Future Sites* (DOE-ID 2009a), remedial action is necessary at TRA-74 to reduce potential threats to human health and the environment. Removal and disposal is the remedy selected by the U.S. Department of Energy Idaho Operations Office, the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (i.e., hereafter referred to as the Agencies) for TRA-74 metals contamination. At TRA-74, this specifically involves removal of a synthetic membrane and contaminated soil, which are expected to exist close to the surface. Arsenic- and lead-contaminated soil and associated debris will be disposed of at the Idaho CERCLA Disposal Facility located at the INL Site.

1.1 Project Objectives

Under the Operable Unit (OU) 10-08 Remedial Design/Remedial Action Work Plan (DOE-ID 2010), the objective of the confirmation sampling activity is to collect and analyze soil samples for arsenic and lead content "…to verify the effectiveness of the selected remedial action and to determine if additional remedial action is necessary prior to termination of the remedial action" (DOE-ID 2009a).

This FSP will support post-remediation sampling to confirm that the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC § 9601 et seq.) remediation goals defined by the OU 10-08 Record of Decision (DOE-ID 2009a) have been met to ensure protection of human health and the environment. Table 1 identifies the risk-based remediation goals for TRA-74. The selected remedy for the TRA-74 site will eliminate this threat by removing the contaminated soil with contaminants of concern exceeding remediation goals.

Table 1. Cleanup levels for TRA-74.[a]

Site	Contaminant of Concern	Cleanup Level (mg/kg)	
		Human Health	Ecological
TRA-74	Arsenic	22[b]	180
	Lead	400	110[b]

a. Information in this table is from DOE-ID (2009a).
b. Shaded numbers denote the cleanup level for the given contaminant (i.e., the lower and more protective goal).

The *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Removal Actions* (QAPjP) (DOE-ID 2009b) governs *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991) project work performed by INL Site employees, subcontractors, and employees of other companies or U.S. Department of Energy laboratories. Sampling plan components required by the QAPjP (DOE-ID 2009b) have been incorporated, as applicable, into this FSP.

1.2 Site Description

The INL Site encompasses 2,305 km^2 (890 mi^2) and is located approximately 55 km (34 mi) west of Idaho Falls in southeastern Idaho (Figure 1). In 1949, the U.S. Atomic Energy Commission, now the U.S. Department of Energy, established the Nuclear Reactor Testing Station, now the INL Site, as a site for building and testing nuclear facilities. At present, the INL supports engineering and operations efforts of the U.S. Department of Energy and other federal agencies in areas of nuclear safety research, reactor development, reactor operations and training, nuclear defense materials production, waste management and technology development, energy technology, and conservation programs.

TRA-74 consists of soil lying beneath the overhead water tank (TRA-718) in the northeast corner of the Advanced Test Reactor Complex. The soil is contaminated with paint chips containing lead and arsenic (Figure 1). The area, measuring 120 × 120 ft, is covered with liner material. From 0 to 6 in. of soil or pitrun material cover the liner, leaving only a small portion of the liner exposed. Remedial actions will remove the liner, the material above the liner, and approximately 6 in. of contaminated soil before soil is collected for confirmation sampling. The area is nonradiologically controlled. Drainage ditches run to the north and east, and two concrete pads lie along the western edge of TRA-677 (Figure 2). A single utility pole is located outside the southwestern corner, and underground electrical duct banks exist both along the southern and eastern edges. The overhead water tank footprint consists of four tower legs and a center pier that contains a manhole for access to subterranean piping. The legs and center pier are placed over concrete foundations, which are in poor condition. The fire water main exits the center pier to the west.

The soil at TRA-74 was contaminated in 1984 when the tank was sandblasted before repainting, and paint chips containing lead and arsenic fell to the ground. In May 2006, Battelle Energy Alliance collected samples from the top 6 in. of soil plus a random sample of the sandblast grit. Based on the sample results, lead and arsenic are the two constituents of concern that pose an unacceptable risk and hazard to future resident and ecological receptors (Cahn et al. 2008). The sampled soil contained no radiological or polychlorinated biphenyl constituents and is approved for disposal in the Idaho CERCLA Disposal Facility. Toxicity characteristic leaching procedure test results for arsenic and lead concluded that the metals are not leachable. The Battelle Energy Alliance data reflected in Figure 2 illustrate that the contaminated soil is concentrated primarily in the northeastern quadrant of the site, and the highest metals concentrations were found in the random sample of residual sandblast grit. Contaminated soil appeared to be associated with the presence of sandblast grit. The samples collected from the western edge and southern portion of the site are below cleanup levels.

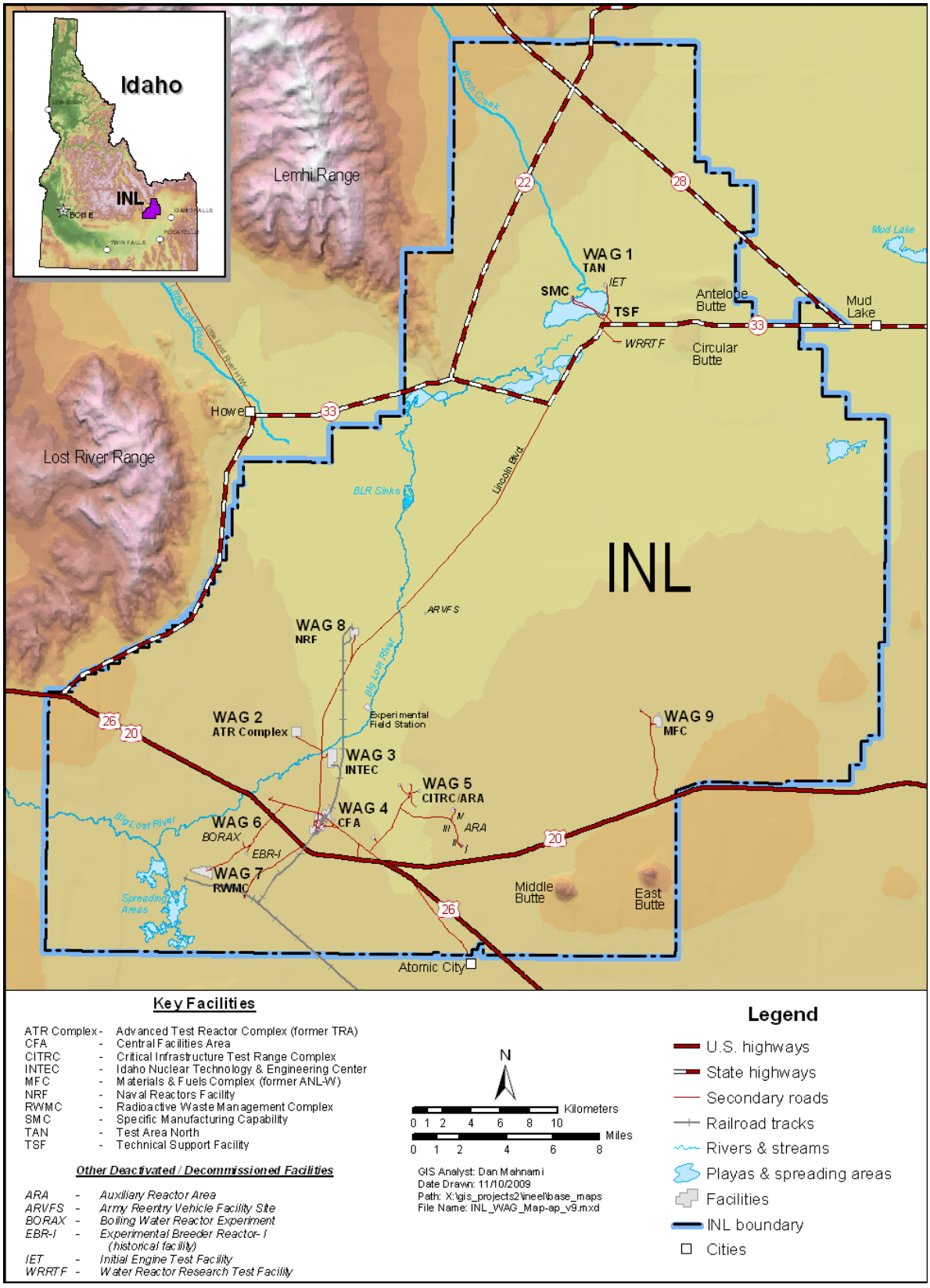
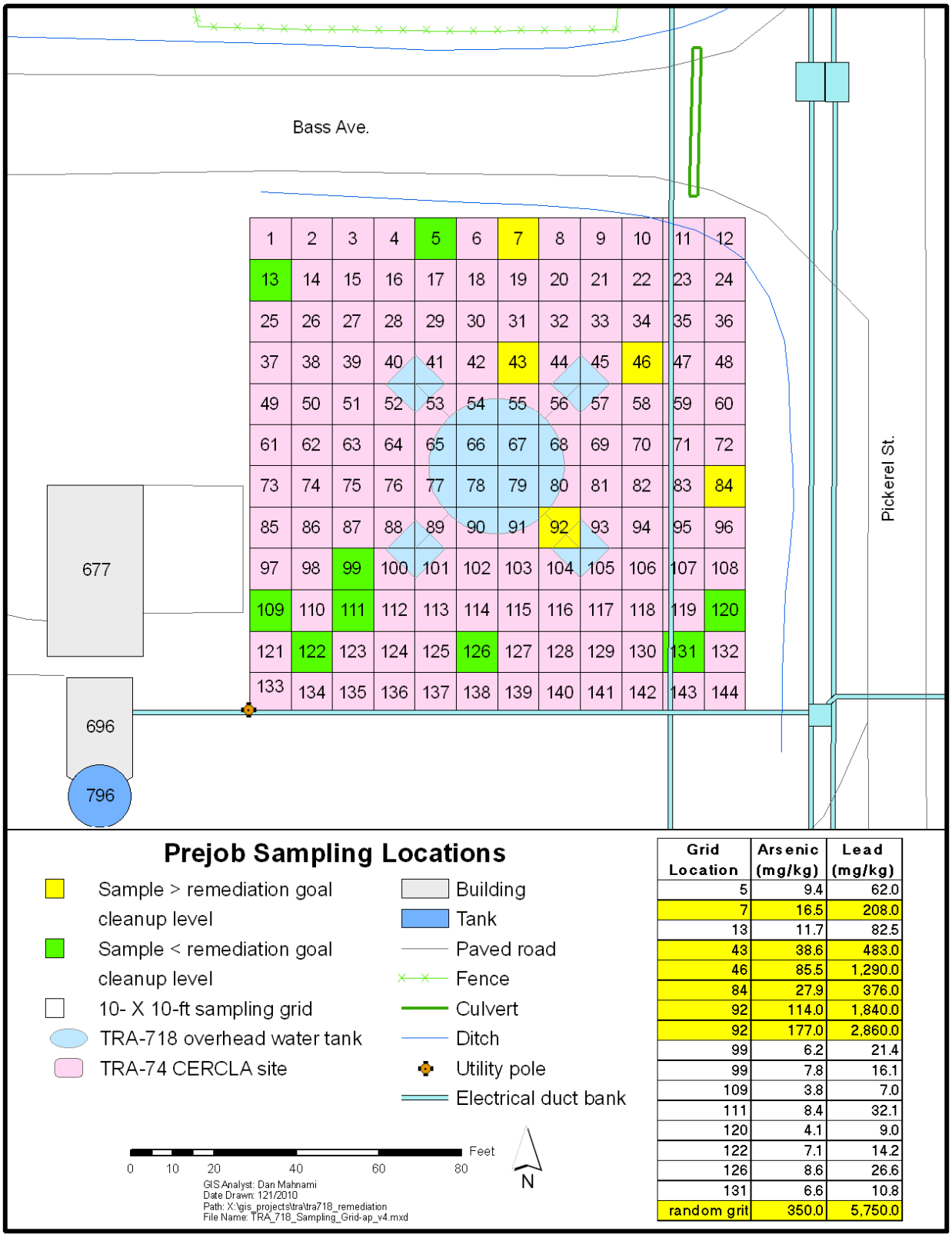


Figure 1. Idaho National Laboratory Site map showing waste area groups and major facility areas.



Grid Location	Arsenic (mg/kg)	Lead (mg/kg)
5	9.4	62.0
7	16.5	208.0
13	11.7	82.5
43	38.6	483.0
46	85.5	1,290.0
84	27.9	376.0
92	114.0	1,840.0
92	177.0	2,860.0
99	6.2	21.4
99	7.8	16.1
109	3.8	7.0
111	8.4	32.1
120	4.1	9.0
122	7.1	14.2
126	8.6	26.6
131	6.6	10.8
random grit	350.0	5,750.0

Figure 2. Summary of Battelle Energy Alliance 2006 sampling effort.

2. PROJECT ORGANIZATION AND RESPONSIBILITIES

Sections 2.1 through 2.4 describe the personnel associated with this FSP. Table 2 lists key personnel assignments and contact information. These responsibilities may change throughout the sampling effort. A logbook entry will be made to show the name of the individual performing the function. Most of the personnel descriptions are provided in PLN-2128, "Environmental Restoration Project Health and Safety Plan." Descriptions of those personnel not included in PLN-2128 are provided in the following subsections.

Table 2. Proposed personnel and job assignments.

Assignment	Name	Phone
Work project manager	Howard Forsythe	208-533-3563
Technical lead	Dean Shanklin	208-533-3542
Field team leaders	Dean Shanklin/Danny Smith	208-533-3542/208-520-4623
Health and safety officer	Nathan Wegener	208-533-0663
Samplers	TBD	TBD
Waste Generator Services	Jason Orme	208-520-6400
Waste Generator Services waste technical specialist	TBD	TBD
Sample and Analysis Management program	Donna Kirchner	208-533-3482
Environmental lead	Brent Burton	208-533-0153
Quality Assurance	Brian Chesnovar	208-520-1301
Environmental Restoration Project facility manager	David Diaz	208-533-3714

TBD to be determined

2.1 Technical Lead

The technical lead is responsible for field activities and for all personnel, including craft personnel, assigned to work at the project location. The technical lead is the interface between operations and project personnel and works to ensure that the sampling team achieves project objectives in a safe and efficient manner. The technical lead coordinates all document preparation, field and laboratory activities, data evaluation, risk assessment, dose assessment, and design activities.

2.2 Waste Generator Services Waste Technical Specialist

The INL Site Waste Generator Services (WGS) waste technical specialist ensures that waste disposal complies with approved INL Site waste management procedures. WGS personnel have the responsibility to help solve waste management issues at the task site. In addition, WGS personnel prepare appropriate documentation for waste disposal and make the proper notifications, as required. All waste is disposed of using approved INL Site procedures, in accordance with PRD-5030/LRD-8000, "Environmental Requirements for Facilities, Processes, Materials and Equipment."

2.3 Sample and Analysis Management Personnel

Sample and Analysis Management (SAM) personnel are responsible for helping to define analyses that will meet project requirements, generating the sampling and analysis plan table and field guidance form, and generating and issuing sample labels. SAM personnel determine the laboratory that will provide analytical services, based on established policies and contracts; ensure that the analytical laboratory uses acceptable methods; and prepare the statement of work (SOW). SAM personnel also track analytical progress and perform a cursory review of the final data packages. SAM personnel obtain data validation, as directed by the project.

2.4 Environmental Support Personnel

Environmental support personnel are assigned to the job site to provide resources and expertise to resolve environmental issues. Personnel assigned to provide this support must be qualified to recognize and evaluate environmental concerns, according to his or her expertise, and are given the authority to take or direct immediate actions to ensure compliance and protection. In addition, environmental support personnel assess and ensure compliance with applicable ICP procedures and documentation, including this document.

3. DATA QUALITY OBJECTIVES

The EPA-developed data quality objective (DQO) process (EPA 2006) helps ensure that the type, quantity, and quality of data used in decision-making are appropriate for the intended application. The DQOs for TRA-74 confirmation sampling were developed using the EPA guidance (EPA 2006) and are summarized in Table 3.

Table 3. Data quality objectives for TRA-74 confirmation sampling.

Item	Description
Problem Statement	The objective of the confirmation sampling activity at TRA-74 is to collect and analyze soil samples for arsenic and lead content to determine whether the remedial activity is complete (i.e., contaminated soil has been removed) or if additional soil removal, followed by more confirmation sampling, is required.
Decision Statement	**Decision Statement 1:** Determine whether arsenic and lead levels in post-remediation excavation soil are below cleanup levels. **Alternative Action 1:** The 95% UCL on the mean concentration in the soil for either arsenic or lead is below cleanup levels; remediation activities are complete. **Alternative Action 2:** The 95% UCL on the mean concentration in the soil for either arsenic or lead is above cleanup levels; remediation activities are not complete.
Inputs to the Decision	• Sampling approach completed as designed • Cleanup levels (22 mg/kg for arsenic and 110 mg/kg for lead) • Remedial action completed as designed • 1984 tank sand-blasting activity • 2006 analytical data from soil samples (total metals and TCLP analysis) • 2006 analytical data from grit • 2006 sampling grid used for random sample collection • Contaminated soil area topography, drainage, proximity to roads and other structures.

Table 3. (continued).

Item	Description
Study Area Boundary	Area to be sampled is described in Section 1.2 and illustrated in figures in Section 4. The boundary of the excavation, approximately 120 × 120 ft, is to be selectively sampled. Sampling will be conducted so that samples are temporally and spatially collocated.
Analytical Approach	**Action level:** The OU 10-08 Record of Decision cleanup levels for TRA-74 are 22 mg/kg for arsenic and 110 mg/kg for lead. **Theoretical decision rule:** If the 95% UCL of the population mean for both arsenic and lead is below the respective cleanup levels, then the remedial action is complete, and no further excavation will be required. If the 95% UCL of the population mean for both arsenic and lead is at or above the respective cleanup levels, additional soil removal will be required.
Performance or Acceptance Criteria	The objective of this sample-collection event is simple and straightforward. The developed sampling design is not statistical; therefore, the analyses prescribed in this step are not applicable. The event will adhere to specific QA/QC procedures to ensure proper design, implementation, and analysis.
Optimize the Sampling Design	The remedial decision will be based on the mean concentration of the contaminant of concern. A 95% UCL of the population mean is used to determine whether the cleanup level has been attained. EPA guidance states that "…data sets with 20 to 30 samples provide fairly consistent estimates of the mean…" (EPA 1992). Because all contaminated materials are expected to be removed during excavation (soil and piping), a random sampling approach—where all soils are presumed to have equal chances of being (or not being) contaminated, combined with biased centerline samples (for worst case data)—is a defensible approach for confirmation sampling.

EPA	U.S. Environmental Protection Agency	QC	quality control
OU	operable unit	TCLP	toxicity characteristic leaching procedure
QA	quality assurance	UCL	upper confidence limit

4. SAMPLE COLLECTION, ANALYSIS, AND DATA MANAGEMENT

4.1 Sample Collection

Confirmation sampling will be used to confirm that cleanup levels are met based on the 95% upper confidence limit (UCL) on the mean for the top 10 ft of soil. Confirmation sampling will be performed after the fencing, liner material, and soil or pitrun material over the liner material has been removed and the area excavated as described in the OU 10-08 Work Plan (DOE-ID 2010).

4.1.1 Sample Locations

Selected sample locations—post excavation—are thought to best reflect the population, both spatially and vertically. A biased-random approach was employed in the following manner:

- The grid to use is similar in size and divided the same as the one developed for the 2006 Battelle Energy Alliance sampling activity (compare Figure 2 with Figure 3). Sample results for the 2006 activity showed that no contaminants of concern were detected above remediation goals within the western or southern grids. Therefore, the new sampling grid was shifted eastward to cover the drainage ditch, and the southern sampling grids were deleted because the northern sampling grids already covered the drainage ditch on the northern side. The grid will be surveyed, beginning at the southwestern corner of grid box A11 (see Figure 3), having site-specific coordinates of N01350.19, E289612.33. From the southwestern corner of grid box A11, the north/south boundary of the grid is defined by site-specific E289612.33, and the east/west line is defined by site-specific N701350.19. Each grid box measures 10 × 10 ft.

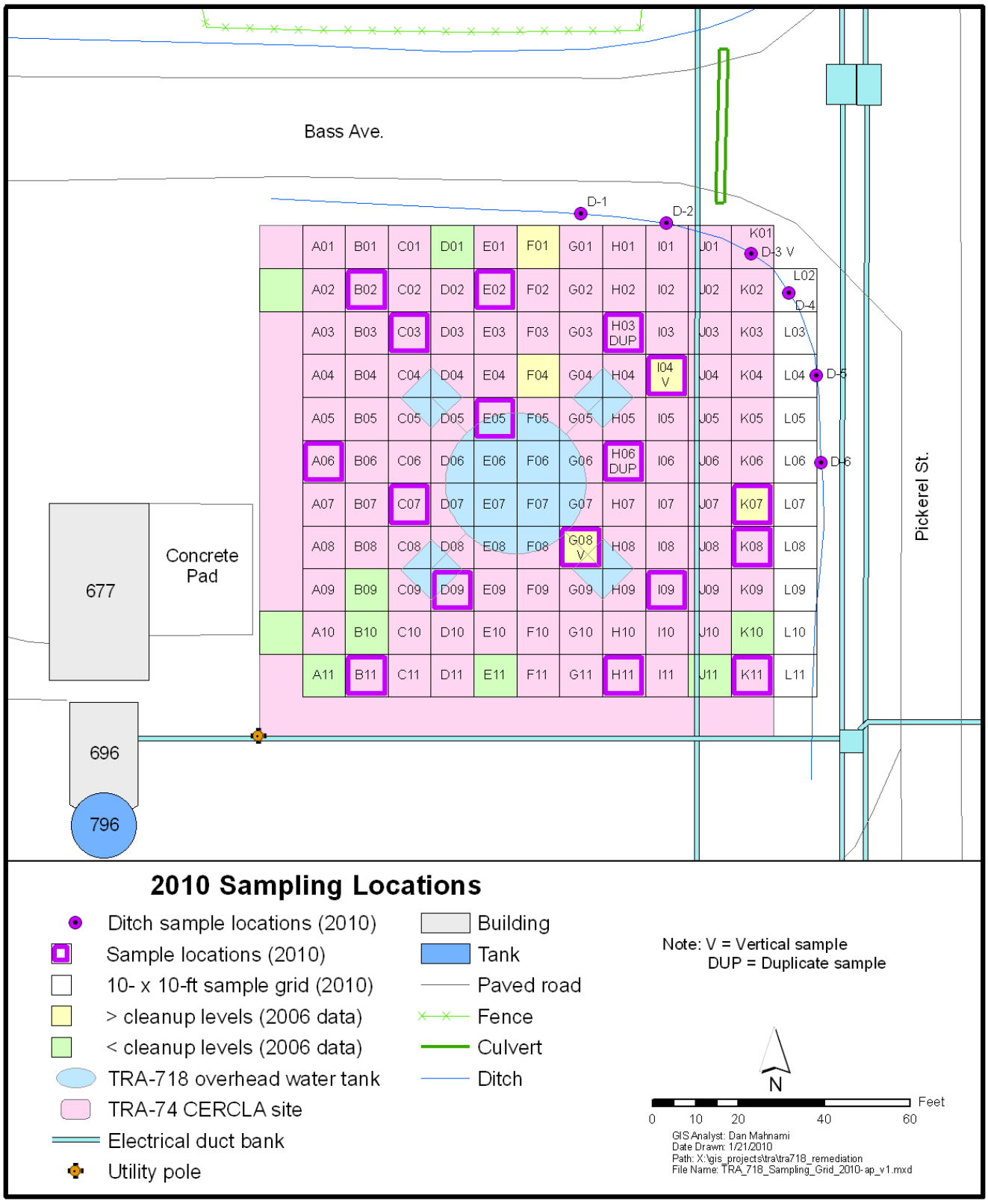


Figure 3. Areas selected for 2010 confirmation sampling.

- Fifteen grid areas were randomly selected for sampling. Two additional grid areas selected for vertical sampling were biased to the grid areas that contained the highest concentrations of contaminants of concern during the 2006 sampling activity.

- Duplicate samples will be collected from grid areas northeast of the overhead tower, where contaminants of concern are more likely to exist.

- Six grab samples will be collected from the drainage ditch northeast of the overhead tower, where surface runoff has most likely transported any contaminated grit.

Figure 3 reflects the sample population delineated by the OU 10-08 Project. For an in situ, simple-random-grid approach to be defensible, the area of concern must be considered to be homogeneous, with evidence that any one unit would vary with regard to contaminant presence. Because contaminated locations are known to exist within the TRA-74 soils population—and the project wants to both generate conservative data and bound the contamination vertically and horizontally beyond the site to the adjacent ditch—a biased sampling strategy is a relevant and defensible approach. The QAPjP recognizes that there are cases where a nonstatistical approach or nonrepresentative samples must be taken to meet project-specific objectives. Samples will be collected from the excavation, as specified in Figure 3. This approach is thought to best reflect the population, both spatially and vertically. A total of 29 samples (27 grabs and two duplicates) are planned for collection and analysis (see Section 4.1.3 for a breakdown). For the soil remaining at the site, collection of more than the EPA-recommended minimum number of samples (i.e., 20)—from vertically and spatially disparate locations—will result in a data set that can be used to calculate a 95% UCL, on the mean, for comparison to cleanup levels for arsenic and lead.

4.1.2 Presampling Meeting

Before sampling, project personnel will meet to ensure that sampling can be performed in a safe and compliant manner that will result in usable data. Project personnel also will ensure that all necessary equipment and documentation are present and all personnel understand the project scope, objectives, hazards, and hazard controls. The corresponding Project Health and Safety Plan (PLN-2128) and other facility manager-authorized work controls will be reviewed to ensure that all hazards have been identified and mitigated accordingly.

4.1.3 Sampling and Analysis Requirements

Surveyors or project personnel will mark the sample locations (center of the grid) prior to sampling activities. Some surface features (e.g., concrete support pads for the water tower) will interfere with sample collection. A sample of soil will be collected from as close to the center of the grid as possible. To be conservative, grab samples shall be collected from the surface of the excavation. At two locations (grid areas G08 and I04), a soil auger will be used to collect samples at the surface, at 1 ft and 2 ft below ground surface. These samples will be collected at depth to verify that the contamination has not migrated downward. If samplers encounter obstructions at a designated sampling location or hit refusal before the established depths, the sample point will be moved to the next available area within the grid. If refusal is met again, the sample will be collected from the available achieved depth, and the depth at which resistance was met will be noted accordingly. Duplicate samples will be collected at two locations to meet quality assurance and quality control (QA/QC) requirements. Grab samples will also be collected at the bottom of the ditch northeast of the water tower. Table 4 lists the sample information, and Figure 3 illustrates the proposed sample locations (i.e., selected grid boxes, center of each grid box).

Table 4. Sample locations.

Location	Sample Type	Depth	Duplicate	Total
A06	Grab	Surface	No	1
B02	Grab	Surface	No	1
B11	Grab	Surface	No	1
C03	Grab	Surface	No	1
C07	Grab	Surface	No	1
D09	Grab	Surface	No	1
E02	Grab	Surface	No	1
E05	Grab	Surface	No	1
G08	Grab	Surface, 1 ft, 2 ft	No	3
H03	Grab	Surface	Yes	2
H06	Grab	Surface	Yes	2
H11	Grab	Surface	No	1
I04	Grab	Surface, 1 ft, 2 ft	No	3
I09	Grab	Surface	No	1
K07	Grab	Surface	No	1
K08	Grab	Surface	No	1
K11	Grab	Surface	No	1
D-1	Grab	Surface	No	1
D-1	Grab	Surface	No	1
D-3	Grab	Surface	No	1
D-4	Grab	Surface	No	1
D-5	Grab	Surface	No	1
D-6	Grab	Surface	No	1
			Total	**29**

Table 5 lists the analysis type, sample media and type, sample container and headspace, preservation, hold time, and total number of samples to be collected. The SAM representative will confirm with the analytical laboratory the minimum volumes needed for each analysis and confirm the sample requirements. Samplers will coordinate with the analytical laboratory to ensure that samples arrive at the laboratory in order to meet holding times.

Duplicates will be collected as identified in the QAPjP (DOE-ID 2009b). Neither trip blanks nor field blanks are required for soil. Disposable sampling equipment will be used so no equipment blanks (i.e., rinsates) will be collected.

Table 5. General summary of samples to be collected at TRA-74.

Analysis Type	Sample Media	Sample Type	Container and Headspace	Preservation	Hold Time (days)	Number of Samples
Total arsenic	Soil	Grab	30 ml glass or plastic with minimal headspace	Cool to 4ºC	180	29[a]
Total lead	Soil	Grab	30 ml glass or plastic with minimal headspace	Cool to 4ºC	180	29[a]

a. Twenty-three surface grab samples, two duplicates, and four core grab samples.

4.1.4 Sample Documentation and Management

The sample team lead will be responsible for controlling and maintaining all field documents and records and for verifying that all documents submitted to the ICP SAM group are maintained in good condition. All entries will be made in indelible black ink. Errors will be corrected by drawing a single line through the error and entering the correct information. All corrections will be initialed and dated.

Any deviations will be brought to the attention of project management. Any changes to the number of samples, the expected approach, or the analytical or QC requirements will be noted in the project-specific log notes. Provided there are no changes to scope, no increased hazards not already accounted for in supplemental work control, no redefined population, or significantly changed strategy, then incidental changes that occur throughout the planning process may be documented in the sample log notes and do not require a Document Revision Form (http://icp-edms.inel.gov/docs/drf_menu.html). A field Document Revision Form can be initiated, as needed, for unexpected conditions encountered in the field.

4.1.4.1 Field Logbooks. Sampling logbooks will be maintained in accordance with company sampling procedures. Field logbooks will be used to record information necessary to interpret the analytical data. All field logbooks will be controlled and managed according to company procedures. The QAPjP discusses use of field team leader, calibration, and shipping logbooks. Some sample programs only use a sample logbook, in which case all pertinent information is recorded in the sample logbook, and no other logbooks are necessary.

4.1.4.2 Sample Logbook. A sample logbook is used to record all pertinent sampling information, including the following:

- Physical measurements (if applicable)
- All QC samples
- Shipping information; samples will be relinquished to project personnel for analysis)
- All team activities
- Problems encountered
- Visitor name
- List of site contacts
- Corrective actions taken as a result of field audits.

The logbook will be signed and dated at the end of each day's sampling activities.

A physical description will be made in the sample logbook and should include the following:

- How material was actually sampled (e.g., which tools were used)
- Depth at which refusal was met, if applicable
- Grid numbers and depths
- Physical consistency
- Any changes to sample locations
- Presence of debris
- QC samples
- Discrepancies from the description in this FSP, with regard to the approach, depth, location, analyses, number of samples, presence of moisture, or physical limitations
- Discussion of any sample set that is not considered representative.

Any deviations must be brought immediately to the attention of project management.

4.1.5 Sampling Equipment, Calibration, and Setup

Sampling equipment, documentation, and any other supplies that will be used for sampling are identified in company standard procedures. Before sampling, new or decontaminated equipment will be obtained to support sampling activities. The following equipment and supplies will be used for sampling, as needed:

- Hand tools (e.g., disposable spades, spoons, scoops, or soil auger)
- Aluminum pans, or equivalent
- Personal protective equipment designated in work control documents authorized by facility management, or as identified by project safety representative
- Stakes or flags to mark sampling locations
- Chain-of-custody (COC) forms
- Sample logbook
- Wipes or absorbent towels
- Sample container and labels
- Authorized work control documents to direct fieldwork (e.g., sampling procedure or technical procedure and job safety analysis as an operational related task or work order)
- Container for staging of samples or ice if samples are not immediately transferred to an analyst
- Adhesive tape
- Individual sample bags and waste bags
- Aluminum foil
- Pens and markers
- Custody seals.

If applicable, Industrial Hygiene personnel will be responsible for measuring and evaluating any chemical hazards. Any monitoring equipment used will be calibrated, as required, in accordance with company procedures. Any monitoring required by Safety personnel will be documented in sample log notes, as applicable.

4.1.6 Sample Designation and Labeling

Waterproof adhesive labels must be generated by the SAM representative and must display pertinent information (e.g., unique sample identifier, name of the project, sample location, and analysis type). The SAM representative will draft a sampling table, numbers, and labels that correlate directly to this sampling activity. Sample team members will provide information necessary for label completion. Such information may include sample date, time, and the sampler's initials. Labels will be completed and placed on containers in the field before samples are collected.

4.1.7 Chain of Custody

COC procedures will begin immediately after the first sample is collected. At the time of sample collection, the sampling team will initiate a COC form for each sample. All samples will remain in the custody of a sampling team member until custody is transferred to the analytical laboratory sample custodian. Upon receipt at the laboratory, the sample custodian will review the sample labels and the COC form to ensure completeness and accuracy. If discrepancies are noted during this review, then immediate corrective action will be sought, and the sampling team member(s) will relinquish custody, as identified on the COC form. Upon completion of the corrective action, the laboratory sample custodian will sign and date the COC form, signifying acceptance of delivery and custody of the samples. COC will be performed in accordance with approved company procedures.

4.1.8 Sample Collection Procedures

Samples will be collected in accordance with company-approved procedures developed under the requirements of the QAPjP. Specific procedures will be identified in the field logbooks.

4.1.9 Equipment Decontamination Procedures

Disposable equipment will be used to collect soil samples. Equipment decontamination will not be required.

4.1.10 Sample Transport

The QAPjP field radiological screening requirements do not apply to TRA-74. It is not a radiologically contaminated nor posted site. Once sampling is complete, samples will be prepared for shipment, and the applicable shipping papers will be completed. Samples will be packaged, and packages will be provided to the Packaging and Transportation shipper for transport, in accordance with MCP-9228. Company-approved work control documents to direct sampling activities will be generated to supplement this FSP.

4.2 Sample Analysis

Laboratories on the ICP Qualified Suppliers List will be used to analyze the samples in accordance with project requirements, including ER-SOW-394, "Sample and Analysis Management Statement of Work for Analytical Services."

Project-specific, request-for-analyses forms, or SOW(s) identify additional requirements for laboratory analysis. Sections 4.2.1 through 4.2.3 identify analysis requirements for the characterization project.

4.2.1 Analytical Methods

To ensure that data of acceptable quality are obtained from the confirmation sampling project, standard EPA laboratory methods or technically appropriate methods for analytical determinations will be used to obtain sample data (see Table 6). The SAM program is responsible for obtaining laboratory analytical services for the required analyses, in accordance with MCP-9439, "Environmental Sampling Activities at the INL." The SAM program will prepare SOWs for laboratory services that include the analytical methods and the project-required detection limits for each analysis type.

Table 6. TRA-74 soil analysis method and method descriptions.

Analytical Method	Method Description
Total target analyte list metals – arsenic and lead only	SW-846 Method 6010C (EPA 2007a)

4.2.2 Instrument Calibration Procedures

Laboratory instruments will be calibrated in accordance with each of the specified analytical methods. The laboratory QA plan must include requirements for calibrations when specifications are not listed in analytical methods. Calibrations that typically are not called out in analytical methods include ancillary laboratory equipment and verification of reference standards used for calibration and standard preparation. Laboratory documentation includes calibration techniques and sequential calibration actions, performance tolerances provided by the specific analytical method, and dates and frequency of the calibrations. All analytical methods have specifications for equipment checks and instrument calibrations. The laboratory will comply with all method-specific calibration requirements for all requested parameters. If failure of instrument calibration or equipment is detected, then the instrument will be recalibrated, and all affected samples will be analyzed using an acceptable calibration.

4.2.3 Laboratory Records

Laboratory records are required to be maintained in accordance with the specific laboratory QA plan. The SAM analytical laboratory authorization processes provide assurance that the analytical laboratories authorized to perform analyses maintain an appropriate laboratory QA plan that addresses laboratory records.

4.3 Data Management and Document Control

4.3.1 Data Reporting

The Environmental Restoration SOW, prepared by the SAM program, will be the requirements standard for analytical data deliverables for laboratories used by the INL Site. All laboratories associated with this project will adhere to the SAM program documents used to establish technical and reporting standards.

4.3.2 Data Validation

Level B data validation has been requested. Analytical data validation is the comparison of analytical results versus requirements established by the analytical method. Validation involves evaluation of all sample-specific information generated from sample collection to receipt of the final data package. Data validation is used to determine whether analytical data are technically and legally defensible and reliable. The final product of the validation process is the validation report. The validation report communicates the quality and usability of the data to decision-makers.

4.3.3 Data Quality Assessment

DQOs are covered in Section 3. In addition to meeting DQOs, the project must specify measurements necessary to produce acceptable data for TRA-74. QA objectives for this project will be met through a combination of field and laboratory checks. Field QC checks will consist of collecting duplicates at the frequencies specified in Table 5. Laboratory checks may consist of initial and continuing calibration samples, laboratory control samples, matrix spikes, and matrix spike duplicates.

Acceptable tolerances are a reference to the statistical evaluation of data measurements. For additional information on acceptable tolerances and target analytical levels, see Chapter 9 of SW-846, *Test Methods for Evaluating Solid Waste* (EPA 2007b).

4.3.4 Prefinal Inspection and Completion Report

Confirmation data and data analysis will be presented in the prefinal inspection report for TRA-74, in accordance with the Federal Facility Agreement and Consent Order (DOE-ID 1991).

In accordance with applicable program requirements, a remedial action completion report will be prepared that will include this project. The report will describe the sample collection effort and the data quality assessment process. The report will contain a summary of all data generated during this sampling effort and will discuss how the data were used. The DQOs will be reviewed and evaluated to determine whether project objectives have been met. Appendixes containing all sample results will be included.

4.3.5 Document Control

Document control consists of the clear identification of all project-specific documents in an orderly form, secure storage of all project information, and controlled distribution of all project information. Document control ensures that controlled documents of all types related to the project will receive appropriate levels of review, comment, and revision, as necessary. Upon completion of the confirmation sampling project, all project documentation and information will be transferred to compliant storage, according to project, program, and company requirements. This information may include field logbooks, COC forms, a sample coordinates map, data reports, and final technical reports.

5. WASTE MINIMIZATION AND MANAGEMENT

Throughout the sampling activity, emphasis will be placed on waste-reduction methods. Practices to be implemented to support waste minimization include, but are not limited to, the following:

- Restrict materials (especially hazardous materials) to those needed to perform work
- Substitute recyclable or burnable items for disposable items
- Reuse items, when practical

- Segregate contaminated from uncontaminated waste
- Segregate reusable items (e.g., personal protective equipment and tools).

Types of waste generated may include sampling equipment (e.g., wipes, aluminum pans, tools, and personal protective equipment). The WGS project representative, with assistance from the waste generator, will prepare waste determination and disposition forms, material profiles, and container profiles. The planned disposition route for all types of sample waste will be the Idaho CERCLA Disposal Facility.

6. HEALTH AND SAFETY REQUIREMENTS

Personnel who sample, transport, and analyze the soil must work under PLN-2128 and project-specific work control that contains hazard identification and mitigation.

7. REFERENCES

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